RESPONSE

THE REJECTION OF CLAIMS UNDER 35 U.S.C. § 112 PARAGRAPH 2

The pending claims were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter the Applicants regard as the invention.

Applicants have herein addressed these rejections by deleting the "biologically active" or "biologically effective" terms from claims 1 and 8, and by inclusion of the limitation that the claimed polypeptide possesses the ability to allow transmembrane potassium ion flow and/or transport. This being the key biological activity of the novel potassium channel identified by the Applicants (see page 9, line 23 of the specification).

Claim 8 has also been amended to remove "capable of" as suggested by the Examiner. The Applicants greatly appreciate the Examiner's provision of a suggested claim amendment.

With regard to the alleged uncertainty over how to select cells that express the biologically active polypeptide, the Applicants point out that it is extremely well established and known to those of skill in the art how to select cells that express the polypeptide of the invention. For example, one standard way is to include a selectable marker in the expression cassette, which confers the ability of transformed cells to grow on or in certain media (i.e. antibiotic resistance markers and the like). Alternatively, cells expressing the polypeptide of the invention could be identified using an antibody selective for the polypeptide. Further, as the biological activity of the polypeptide has now been defined, other ways of selecting the desired cells would be apparent to the person skilled in the art.

The Applicants believe that the claim amendments overcome the indefiniteness rejections raised by the Examiner.

THE REJECTION OF CLAIMS UNDER 35 USC § 112 PARAGRAPH 1

Claims 1, 3, 5 and 8-9 stand rejected under 35 U.S.C. 112, first paragraph for lack of enablement. Applicants believe that the Examiner's basis for rejection is overcome by the newly proposed claim amendments.

The Examiner has remarked that the specification is enabled for the polynucleotide of SEQ ID No. 2 and the polypeptide encoded thereby (SEQ ID NO:3) and associated uses thereof (host cells, expression vectors etc.) but not, to paraphrase, for the other variant

sequences encompassed by the claim, "because it is unclear what specific activity is being affected".

The proposed amended claims do now recite a specific biological activity that the polypeptide(s) of the invention must possess. Furthermore, the specification fully describes methods that the person skilled in the art can use to determine whether or not a polypeptide possesses this requisite biological activity.

In view of the Applicants' original description and in view of the amended claims set forth herein, it is respectfully submitted that the Applicants have enabled the invention encompassed by Claims 1, 3, 5 and 8-9. The Applicants courteously solicit the Examiner to withdrawal the rejection for lack of enablement under 35 USC §112 Paragraph 1.

The claims are also rejected as allegedly not conveying to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In view of the proposed claim amendments, and the teaching in the application as filed, the Applicants respectfully submit that this rejection is also overcome.

Applicants have cloned, sequenced, characterized and thus identified a novel brain derived potassium channel. It is well established in the art that within the population at large there allelic variants of any specific protein will be found. It is also well established in the art that truncated variants of many proteins can be made without substantially altering the biological activity of the protein. Furthermore, whilst it is acknowledged that a single amino acid substitution at a particular location can potentially destroy a particular biological activity, it is also well established that most amino acids can be changed without substantially altering the particular biological activity at issue.

The specification describes what "variants" are encompassed by the claims (see page 19, line 15 onwards), it discloses deletion, insertion, substitution and truncation variants, it teaches what amino acid substitutions (particularly conservative amino acid substitutions) may be made (see Table 1 and accompanying text), and notes that computer programs well known in the art, for example DNAStar, can be used to predict what amino acid substitutions can be made without substantially altering the biological activity of the protein. The proposed amended claims do now recite a particular biological activity that can be easily measured by a person skilled in the art. The common attribute or characteristic that identifies members of the genus is the ability to allow transmembrane potassium ion flow and/or transport.

To require the Applicants to limit their claims to the polypeptide depicted in SEQ ID No. 3 would unduly restrict the claimed invention and severely devalue the contribution to the art that the Applicants have made. A competitor could take advantage of the invention, and avoid the claim, simply by altering a few amino acids using no more than the teaching in the specification. Although only a single species is specifically exemplified within a broad genus, numerous other species are taught and disclosed. The Applicants assert that the person skilled in the art would, from reading the present specification, and from knowledge in the art, be able to design and test numerous variants of the potassium channel of the invention and identify those that possess the requisite ability to allow transmembrane potassium ion transport and/or flow and, that such variants are therefore described in the specification in such a way as to convey to one skilled in the relevant art that the Applicants/inventor(s) were, at the time the application was filed, in possession of the claimed invention.

In view of the Applicants' original description and in view of the amended claims set forth herein, the Applicants courteously solicit the Examiner to also withdraw the 35 USC §112 Paragraph 1 rejection.

THE REJECTION OF CLAIMS UNDER 35 USC § 102(b)

Claims 1, 3, 5 and 8 stand rejected as being anticipated by Yokoyama *et al.*

As noted in Applicant's previous response, the polypeptide of Yokoyama is only 393 amino acid residues long and actually represents a "short splice variant" of the KCNQ2 gene. Although the Yokoyama polypeptide may possess the ability to bind another subunit, ligand or co-factor, it is incapable of functioning as a potassium channel (allowing transmembrane potassium ion transport and/or flow). The Yokoyama polypeptide is missing the C-terminal tail of the polypeptide of the present invention and the Applicants have found that the Yokoyama polypeptide is not capable of functioning as a potassium channel (see page 18, line 8 "Functional expression of the brain-derived potassium channel subunit described herein yields currents which are suppressed by HNSPC"). The amended claims require the polypeptide to be capable of allowing transmembrane potassium ion transport and/or flow.

As the HNSPC polypeptide of Yokoyama *et al.* lacks this ability it falls outside the claim. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the 35 USC §102 rejection and allow the claims set forth in this response.

THE REJECTION OF CLAIMS UNDER 35 USC § 103(a)

Claim 9 stands rejected as being obvious over Yokoyama *et al.* in view of Li *et al.* (WO 96/03415). In view of the fact the protein of Yokoyama *et al.* does not possess the requisite biological activity (potassium ion transport) recited in the amended claim, the Applicants submit that the claimed invention cannot then be considered obvious over Yokoyama *et al.* in combination with Li *et al.*

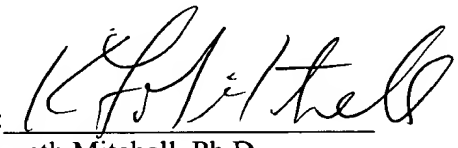
Accordingly, Applicants respectfully request that the rejection under 35 USC §103(a) be withdrawn.

CONCLUSION

For the foregoing reasons the Applicants respectfully submit that Claims 1-5, 8 and 9 are now in condition for allowance in a single grant. Early action toward this end is courteously solicited. The Examiner is encouraged to telephone the undersigned in order to expedite any detail of the prosecution. The Applicants herein request further examination and reconsideration of the application, in view of the following remarks.

Respectfully submitted,

Dated: June 21 , 2001

By: 

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APPENDIX

1. (Twice amended) A purified polynucleotide comprising a nucleic acid sequence which encodes a polypeptide comprising a sequence having at least 85% total sequence similarity to SEQ ID NO:3 or a [~~biologically active~~] fragment thereof, said polypeptide possessing the ability to allow transmembrane potassium ion flow and/or transport.

8. (Twice amended) A method for producing cells which express a [biologically active] polypeptide comprising a sequence having at least 85% total sequence similarity to SEQ ID NO:3, or a [biologically active] fragment thereof, said polypeptide possessing the ability to allow transmembrane potassium ion flow and/or transport, said method comprising:

a) transforming suitable host cells with a polynucleotide comprising a nucleic acid that encodes a polypeptide comprising a sequence having at least 85% total sequence similarity to SEQ ID NO:3 or a [biologically active] fragment thereof, said polypeptide possessing the ability to allow transmembrane potassium ion flow and/or transport; and,

b) selecting cells [capable of] expressing the [biologically active] polypeptide encoded by the introduced nucleic acid.